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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

NCR Docket No. 9261

Application of:

WATSON, C.

Group Art Unit: 2165

Serial No. 09/728,852

Examiner: Mahmoudi, Hassan

Filed: December 1, 2000

For: METHOD AND APPARATUS FOR PARTITIONING DATA FOR STORAGE  
IN A DATABASE

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450


APPEAL BRIEF TRANSMITTAL LETTER

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Transmitted herewith for filing is an Appeal Brief to the Final Rejection dated  
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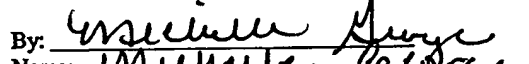
Respectfully submitted,

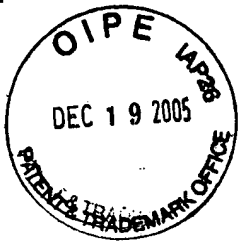
  
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By:   
Name: Michael George



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: M. Cameron Watson

Serial No.: 09/728,852

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FOR PARTITIONING DATA  
FOR STORAGE IN A  
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§ Group Art Unit: 2165

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Examiner: Hassan Mahmoudi

Atty. Dkt. No.: 9261 (NCR)

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**BRIEF IN SUPPORT OF APPEAL**

This is a brief in support of Applicant's notice of appeal filed on September 16, 2005, in response to the final rejection dated May 18, 2005, in this matter. Applicant is filing this brief along with any required fee.

12/21/2005 LWONDIH1 00000005 140225 09728852

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By: Michelle George  
Name: Michelle George



**(1) REAL PARTY IN INTEREST**

The real party in interest in this matter is NCR Corporation, Dayton, Ohio, by virtue of an assignment recorded at reel 011344, frame 0971-0073, on December 1, 2000.

**(2) RELATED APPEALS AND INTERFERENCES**

Applicant is aware of no active appeals or interferences related to this application.

**(3) STATUS OF CLAIMS**

Claims 1-9, 11-31 are currently pending. Claims 1-9, 11-13, and 17-31 are subject to a final rejection and are under appeal. Claims 14-16 are allowable but have been objected to as being dependent upon a rejected base claim. The text of the claims, as currently pending, is attached as an appendix to this brief.

**(4) STATUS OF AMENDMENTS**

On July 18, 2005, Applicant filed a reply to the final rejection dated May 18, 2005. This reply does contain an amendment to claims 1, 11, and 19 for grammatical and clarity reasons. Applicant asks that the amendments be entered. In an Advisory Action mailed on August 2, 2005, the Office rejected Applicant's rebuttal arguments and maintained the rejections.

**(5) SUMMARY OF CLAIMED SUBJECT MATTER**

Generally, when data is transmitted from one system to another, such as from a server system to a client system, a certain amount of efficiency in retrieving the data is desired. Often, a database may be accessed by a plurality of users or one user may issue a plurality of queries. Allowing for more efficient access of data from a database can ease the computing congestion that occurs when multiple queries are being processed. Specification page 3, lines 22-26.

Independent claim 1 recites a method, comprising receiving data to be stored in a database system having plural data servers (e.g., page 5, lines 20-22, fig. 2, elements 120 and 260); receiving information associated with at least one characteristic of the data

(e.g., page 5, lines 13-15 and fig. 2, elements 110, 120, 130); partitioning the data for storage in the database system based on the characteristic associated with the data (e.g., page 5, lines 15-16 and fig. 2, element 110); storing the partitioned data in storage units associated with the plural data servers (e.g., page 5, lines 20-22, fig. 2, elements 120 and 260); and in response to a database query, selecting less than all the plural data servers based on the partitioning of the data to reduce a number of data servers involved in processing the database query (e.g., page 7, lines 16-29 and fig. 3, 110, 320, 340, and 350).

Independent claim 11 recites a system, comprising a database (e.g., page 5, lines 20-22 and fig. 1, element 120); a network interface (e.g., page 5, lines 24-25 and fig. 3, element 310); plural storage modules and data servers (e.g., page 5, lines 20-22 and fig. 2, element 260); and a database controller coupled to the database, wherein the database controller is adapted to receive partitioning information and perform a partitioning task on data received through the network interface based on the partitioning information to partition the data into plural groups, the database controller adapted to further store the plural groups of the data partitioned by the partitioning task into plural storage modules associated with corresponding plural data servers, the database controller adapted to select, in response to a database query, less than all the plural data servers based on the partitioning information to reduce a number of data servers involved in processing the database query (e.g., page 6, lines 4-20; page 7, lines 3-29; fig. 2, elements 130, 185, 110, 120, and 260; and fig. 3, elements 310, 320, 330, 340 and 350).

Independent claim 19 recites an article, comprising one or more storage media containing instructions that when executed cause a device to (e.g., page 15, lines 4-14) receive information associated with at least one characteristic of data to be stored into a database system from a remote device; partition the data for storage in the database system based on the characteristic of the data (e.g., page 6, lines 4-20; page 7, lines 3-29; fig. 2, elements 130, 185, 110, 120, and 260; and fig. 3, elements 310, 320, 330, 340 and 350); store the partitioned data in the database system in plural storage modules associated with plural data servers (e.g., page 5, lines 20-22 and fig. 2, element 260); and in response to a database query, select less than all the data servers based on the information to reduce a number of data servers involved in processing the database query

(e.g., page 7, lines 16-24; fig. 2, elements 110, 120, and 260; and fig. 3, elements 310, 320, 330, 340, and 350).

## **(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

- A. Can a Reference that fails to anticipate all the elements of Independent Claims 1, 11, and 19 render those claims unpatentable.
- B. Can References that do not show or suggest all the elements of Independent Claim 1 render obvious claims 4 and 5 which depend from claim 1.
- C. Can References that do not show or suggest all the elements of Independent Claim 1 render obvious claims 9, 12, and 13 which dependent from claim 1.

## **(7) ARGUMENT**

All rejected claims should be allowed over the cited references for the reasons set forth below.

### **A Can a Reference that fails to anticipate all the elements of Independent Claims 1, 11, and 19 render those claims unpatentable.**

Independent claims 1, 11, and 19 were rejected under 35 USC § 102(b) as being anticipated by Nazem et al. (U.S. Pat. No. 5,983,227). Nazem does not show or suggest “receiving data to be stored in a database system having plural data servers,” as required by Applicant. In the Office Action mailed 5/18/2005, the Office incorrectly equates Applicant’s database system to Nazem’s page servers 104, illustrated in figures 1 and 2. Nazem’s page servers 104 are clearly described as web servers designed to scale better than the prior art (col. 1, lines 14-57). It is well known in the art, that a web server returns web pages that have been requested by a web browser. Web servers and database systems have very specific purposes, features, and functions and a person of ordinary skill in the art, at the time, would not have considered a web or page server equivalent to a database system and it is improper for the Office to equate them.

Nazem does teach the use of a single database, depicted in figure 1 as a “User Configuration Database” 116, for the purpose of storing “user templates”. (Col. 3, lines

26-29.) As shown in figure 1, Nazem teaches the database is separate from the page servers 104 and furthermore, there is no teaching that plural data servers are present in Nazem's database. Nazem further shows that the database and page servers are separated by a network, a server, and at least one level of application software. It is clear from the illustrations, descriptions, and terminology that Nazem understood the purposes, features, and functions of a database and page server and properly used the correct terms to teach his invention. Furthermore, any attempt to equate this database to Applicant's database system would be improper because Nazem's database does not contain all the required elements of Applicant's claims.

In the advisory action, mailed 8/2/2005, the Office improperly defines a "database" as "a large collection of data." The Office further asserts that because "a page server contains a large collection of data (page contents)," it is equivalent to Applicant's database system. Applicant respectfully disagrees. The Office has improperly used an overly broad and simplistic definition for a database system that fails to capture the minimum attributes required to define a database and that would encompass inventions that are clearly not databases, as has occurred here. For example, a 500 page document would be considered a large collection of data, but it is not a database system. While Applicant acknowledges the MPEP's requirement "to give claims their broadest reasonable interpretation," it also requires that the interpretation be *reasonable* in light of the supporting disclosure. The Office's interpretation is not reasonable in light of the specifications – either Nazem's or Applicant's – or in light of the ordinary meanings of the terms database system and page or web servers. The Office has failed show that Applicant's database system is present in Nazem. Therefore, at least this element of Applicant's claimed invention is missing.

Applicant further requires "in response to a database query, selecting less than all the plural data servers based on the partitioning of the data to reduce the number of plural data servers involved in processing the database query." Nazem teaches web servers that scale better than the prior art. Nazem does not teach database queries or a response to a database query. Nazem's page servers respond to requests for web pages, from web browsers. Furthermore, Nazem does not show or suggest *selecting less than all the plural data servers* based on the *partitioning* of the data to reduce the number of plural

data servers involved in processing the database query. Nazem's page servers are involved in processing requests for web pages, not database queries. Nazem teaches that the sports 230, stock 232, and news 234 servers provide live data, which is stored in shared memory and later used to process requests for a web page from a web browser. Hypothetically, even if the web page request is equated to a database query and the page server is equated to a database, as suggested by the Office, Nazem clearly teaches that the requested web page is created from live data stored in a common shared memory 212 (col.3, lines 59-63) and not by selecting less than all of the data servers. Nazem simply selects whatever data is required to create a requested web page, from the information stored in *shared memory*. There is no teaching that less than all the data servers are selected, as required by Applicant, because there is no teaching that any of Nazem's servers are selected nor is there a teaching that data is partitioned across data servers so that less than all the data servers can be selected. Nazem is simply missing the above elements that are required by Applicant's claims.

For the reasons above, the final rejection of claims 1, 11, and 19 should be reversed.

**B. Can References that do not show or suggest all the elements of Independent Claim 1 render obvious claims 4 and 5 which depend from claim 1.**

Dependent claims 4 and 5 were rejected under 35 USC § 103(a) as being unpatentable over Nazem et al. (U.S. Pat. No. 5,983,227) in view of Sinden (U.S. Pat. No. 6,580,826). In the Office Action mailed 5/18/2005, the Office states that Sinden teaches a method for encoding handwritten symbols. The term database does not even appear in Sinden. Sinden therefore does not overcome the deficiencies of Nazem described above so the combination of the references also fails to overcome the rejection of independent claim 1 and claims 4 and 5 which depend from claim 1. Claims 4 and 5 are therefore allowable.

**C. Can References that do not show or suggest all the elements of Independent Claim 1 render obvious claims 9, 12, and 13 which dependent from claim 1.**

Dependent claims 9, 12, and 13 were rejected under 35 USC § 103(a) as being unpatentable over Nazem et al. (U.S. Pat. No. 5,983,227) in view of Garth et al. (U.S. Pat. No. 6,678,701). Garth teaches a technique that uses periodic check-pointing of data during the loading of large amounts of data into a database. The technique further teaches that, should the loading of data fail at some point, the data loading process can be restarted from the last checkpoint, thus reducing the time needed to load data should an error occur. While Garth does teach the use of databases, it does not overcome the deficiencies of Nazem as described above so the combination of Nazem and Garth does not show or suggest all the elements of Applicant's claim 1 or claims 9, 12, and 13 which depend from claim 1. Claims 9, 12, and 13 are therefore allowable.

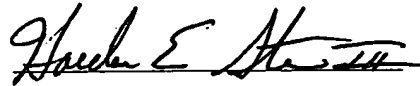


#### **D. Conclusion**

None of the references cited show or suggest all of the features of Applicant's claims. Applicant therefore asks the Board to reverse the examiner's rejections and to allow all of the claims.

Please apply any charges or credits that might be due, except the issue fee, to the NCR Corporation deposit account number 14-0225.

Respectfully submitted,



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## **APPENDIX A - Current Listing of Amended Claims**

1. (currently amended) A method, comprising:  
receiving data to be stored in a database system having plural data servers;  
receiving information associated with at least one characteristic of the data;  
partitioning the data for storage in the database system based on the characteristic associated with the data;  
storing the partitioned data in storage units associated with the plural data servers;  
and  
in response to a database query, selecting less than all the plural data servers based on the partitioning of the data to reduce a the number of plural data servers involved in processing the database query.
2. (previously amended) The method of claim 1, wherein receiving the information comprises receiving the information from a client system.
3. (original) The method of claim 1, wherein receiving the information comprises receiving at least one of an average value of the data, a uniform distribution of the data, a minimum value of the data, and a maximum value of the data.
4. (original) The method of claim 3, wherein partitioning the data comprises defining straight-line segments based on at least one of the average value of the data, the uniform distribution of the data, the minimum value of the data, and the maximum value of the data.
5. (original) The method of claim 4, wherein partitioning the data further comprises defining breakpoints to provide the straight-line segments.

6. (previously amended) The method of claim 1, wherein partitioning the data for storage in the database system comprises dividing the data into buckets containing related data.

7. (original) The method of claim 1, wherein partitioning the data comprises organizing the data into related portions.

8. (original) The method of claim 7, wherein partitioning the data further comprises executing an algorithm to organize the data.

9. (original) The method of claim 1, wherein storing the partitioned data in the database system comprises storing the partitioned data in a relational database system.

10. (cancelled)

11. (currently amended) A system, comprising:

a database;

a network interface;

plural storage modules and data servers; and

a database controller coupled to the database, wherein the database controller is adapted to receive partitioning information and perform a partitioning task on data received through the network interface based on the partitioning information to partition the data into plural groups,

the database controller adapted to further store the plural groups of the data partitioned by the partitioning task into plural storage modules associated with corresponding plural data servers,

the database controller adapted to select, in response to a database query, less than all the plural data servers based on the partitioning information to reduce a the number of plural data servers involved in processing the database query.

12. (previously amended) The system of claim 11, wherein the database is part of a parallel database system.

13. (original) The system of claim 11, wherein the database is a relational database.

14. (previously amended) The system of claim 11, wherein the database controller comprises:

a query coordinator coupled to the network interface, the query coordinator to receive the database query from the network interface;

a partitioner to partition data and perform selecting of less than all the plural data servers; and

a partitioner data storage coupled to the partitioner, the partitioner data storage to store the partitioning information associated with at least one characteristic of the data to enable the partitioner to partition data.

15. (previously amended) The system of claim 14, wherein the partitioner is capable of executing an algorithm, based on the stored partitioning information, for partitioning the data.

16. (previously amended) The system of claim 15, wherein the plural data servers are adapted to store and access partitioned data in the database.

17. (original) The system of claim 11, further comprising a client system, wherein the client system sends data to the database through the network interface.

18. (previously amended) The system of claim 17, wherein the client system is adapted to further send the partitioning information to be used by the database controller to partition the data.

19. (currently amended) An article comprising one or more storage media containing instructions that when executed cause a device to:

receive information associated with at least one characteristic of data to be stored into a database system from a remote device;

partition the data for storage in the database system based on the characteristic of the data;

store the partitioned data in the database system in plural storage modules associated with plural data servers; and

in response to a database query, select less than all the plural data servers based on the information to reduce a the number of plural data servers involved in processing the database query.

20. (original) The article of claim 19, wherein the instructions when executed cause the device to execute an algorithm to partition the data.

21. (original) The article of claim 19, wherein the instructions when executed cause the device to divide the data into segments containing related data.

22. (previously presented) The method of claim 1, wherein receiving the information comprises receiving organizational information, and wherein selecting less than all the plural data servers is based on the organizational information.

23. (previously presented) The method of claim 22, wherein selecting less than all the plural data servers is based on the organizational information and a characteristic of data requested by the database query.

24. (previously presented) The method of claim 1, further comprising:  
retrieving search results obtained by the selected data servers;

determining whether the search results are satisfactory; and  
selecting at least one more data server to process the database query if the  
search results are not satisfactory.

25. (previously presented) The method of claim 1, wherein partitioning the  
data comprises partitioning the data into logical groups.

26. (previously presented) The method of claim 1, further comprising storing  
the information by a partitioner, wherein selecting less than all the data select is  
performed at least in part by the partitioner.

27. (previously presented) The system of claim 11, the database controller to  
select less than all the plural data servers based on the partitioning information and a  
characteristic of data requested by the database query.

28. (previously presented) The system of claim 11, wherein the selected data  
servers are adapted to retrieve search results in response to the database query, and the  
database controller is adapted to determine whether the search results are satisfactory and  
to select at least one more data server to process the database query if the search results  
are not satisfactory.

29. (previously presented) The article of claim 19, wherein the instructions  
when executed cause the device to receive information comprising partitioning  
information.

30. (previously presented) The article of claim 29, wherein the instructions  
when executed cause the device to select less than all the plural data servers based on the  
partitioning information and a characteristic of data requested by the database query.

31. (previously presented) The article of claim 19, wherein the instructions when executed cause the device to:

retrieve search results obtained by the selected data servers;

determine whether the search results are satisfactory; and

select at least one more data server to process the database query if the search results are not satisfactory.